

Five basic steps for assisting math students

Guidelines for Tutors

1. **Develop a sense of trust.** Do not laugh or make fun of the student. Everyone has a subject or class that they do better in than others.
2. **Tutors should make things easy for the student to understand.** Give different examples. Think of alternative ways to explain the idea or subject.
3. **Do not be afraid to admit that you don't know something.** Do not give incorrect information to "save face."
4. **Ask questions that require more than a yes or no answer.** *Examples:* Can you tell me why this happens? Why is it done this way? What do you think should be done next?
5. **Your students should be able to explain what they have learned to you and what they do not understand or feel they can't learn.** Ask the student to explain what they've learned from you.
6. **Be a good listener and a good role model.**
7. **Have fun while tutoring and learning.**
8. **Never do the student's homework or answer the questions for them.** This does not help them or teach them.
9. **Build on what the student already knows.** Simplify the process as much as possible. Often students over-complicate the material.
10. **Bad attitudes often make up for the fear students feel when trying to compete in class.**
11. **Emphasize that mistakes are corrected, not used as an excuse to quit.**
12. **The only attention some students know is negative, and positive strokes are something they don't understand.**
13. **When they tell you it's boring, they may mean they are having a hard time and would rather turn their attention to something else. Take a short break.**

Step one: Always look at the problem in the book. Never trust that a student has set it up correctly.

Step two: Ask student to explain the procedure s/he is using to solve the problem. You can troubleshoot and listen for erroneous logic or incorrect procedures at that time.

Step three: Reinforce any correct procedures (e.g. "This part is done correctly", or "You are on target here".) Then identify incorrect logic and ask the student to consider what else s/he might try. You can provide a hint, but avoid explanations until after the student has attempted a guess. (E.g. "When you evaluate an integral, what do you evaluate first, the upper or lower part?")

Step four: To check for understanding, have the student re-explain the procedure to you. *Avoid asking questions like, "Does that make sense to you?" and "Do you understand now?"*

Step five: Disengage! Encourage the student to work the next problem on his/her own, but let him/her know you will check back. Do not get drawn into working the next problem with an insecure student. S/he needs to develop the ability to apply what s/he is learning without your supervision.

Five tips for math tutors

Guide student: A math tutor should guide a student through the solution process. Ask the student leading questions that will direct the student towards the correct steps. Avoid doing problems for the student. If the student cannot get the correct answer and asks for help, the tutor should look at what the student has done and try to locate the error. Then have the student work a similar problem to make sure he/she has grasped the concept or procedure.

Teach Concepts: Tutoring goal should be to help students become an independent learner. In mathematics, it is important to teach concepts rather than just processes or procedures. For example, the tutor should explain why it is important to follow the "order of operations" rule, PEMDAS, rather than just showing the student how to do it. Understanding the concepts makes remembering the procedures easier.

Encourage Students to Meet with the Teacher: Some students believe getting help from a tutor is a substitute for meeting with the teacher. Students having difficulty in math must realize time spent with a tutor is additional to also getting help with the teacher.

Address Math Anxiety: Tutors will deal with students with varying degrees of math anxiety. Tutors should avoid using phrases such as, "this is easy." Such phrases intimidate the student. If the student suffers from a high degree of math anxiety it may be helpful to refer the student to a counselor. Sometimes it is helpful to learn about the student's math background. If the tutor believes the student is enrolled in a course the tutee is not ready for, talk to the instructor.

Don't Confuse the Student! If the tutor is unsure of a mathematical procedure or concept, check with a math instructor. It is helpful to find out what approach the text or instructor is using on a particular problem. A tutor using the same technique as the text or instructor will reinforce the concept or procedure, whereas using a different approach can confuse the student.

Overcoming math and science anxiety: Many people believe mathematics and sciences can be conquered only by certain kinds of people. This myth destroys potential, provides excuses and limits our possibilities. What is required is persistence and patience. Learning Math and Science takes time and effort, but it is worth the investment!

National Honors Society Training

Five suggestions for overcoming math/science anxiety include:

Do not confine yourself to exact answers or processes. Most problems have more than one method for reaching an answer. Sometimes it is easier to work from an answer to a problem/question than vice-versa.

Do not use self-defeating talk. Use constructive self-talk when referring to your abilities in mathematics and science.

Do not run away from your intuition since it could lead you towards a possible solution and understanding of the concept and application.

Do not consider your questions dumb or stupid when something is unclear or questionable.

Do not run away from math/science frustrations. Try to keep a journal where you jot down strengths, triumphs, areas to further address, and emotions about areas of study.

Tutor code of ethics The National Association of Tutorial Services uses the following Tutor Code of Ethics, which is also adopted by the BSU TRIO Peer Tutoring program:

1. Subject proficiency and knowledgeability have top priority.
2. My major motivation is building the student's self-confidence.
3. My student deserves and will receive my total attention.
4. The language my student and I share must be mutually understood at all times.
5. I must be able to admit my own weaknesses and will seek assistance whenever I need it.
6. Respect for my student's personal dignity means I must accept that individual without judgment.
7. My student will constantly be encouraged but never insulted by false hope or empty flattery.
8. I will strive for a mutual relationship of openness and honesty as I tutor.
9. Both the student and I will always understand my role is never to do the student's work.
10. I count on my student to also be my tutor and teach me ways to do a better job.
11. I will do my best to be punctual and keep appointments, not only out of courtesy, but also as an example for my student to follow.
12. I will be sure to sign-in with the tutor center and notify Mr. Irons about any issues that might come up while I am working with the student.
13. Good tutoring enables my student to transfer learning from one situation to another.
14. Making learning real for the student is what tutoring means and is an important part of my goal.
15. My ultimate tutoring goal is my student's independence.

Building Blocks of Effective Tutoring

1. **Good tutoring is based on mutual respect and trust...**never on an attitude of condescension. Curb any inclination to impress. You are there to help.
2. **Use reflective Questioning.** This technique will help you with many of the other building blocks that follow. When you are asked a question, rephrase it, break it into parts and reflect it back to the group or student for response. The purpose of this is to generate discussion, get students to make connections *themselves* and pull information together. It may be easy for you, a knowledgeable tutor, to answer questions directly. However, if students reason out the answer or put the pieces together themselves, they are far more likely to remember.

Example

STUDENT: I don't understand Islam. What is the Koran all about and how does Mohammed fit into Islamic doctrine?

TUTOR: That is a complex question. As you understand it, what are some of the basic doctrines of Islam? We will discuss Mohammed and the Koran after we discuss the first part of your question.

3. Teach students how to learn. Don't just solve the student's problem. Work the concepts.
4. Make sure the student understands the problem and the associated vocabulary.
5. Be understanding of student needs. Pay attention to student reactions and learn to "read" them.
6. Tutor to the situation. Don't go beyond the immediate need.
7. Develop a sense of empathy. Recall a class that was difficult for you and remember that not all students find the same subjects easy to understand.
8. Use different approaches in problem solving.
9. Come prepared: Walking into a tutorial session prepared sends a clear, strong message to the students of the importance and pride you as a tutor place on the upcoming session. It is especially meaningful to follow up with the plan of action, objectives, and goals set during the last tutorial session. To do this, tutors model to the student a commitment and enthusiasm by coming prepared. Coming prepared includes:
 - Overcoming personal anxieties
 - Feeling comfortable with the subjects/material
 - Having a positive attitude and utilizing all available resources.